POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Communication Networks [S2EiT2E-TIT>STKOM]

Course

Field of study
Electronics and Telecommunications

Year/Semester
1/1

Area of study (specialization)
Information and Communication Technologies

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Lecturers

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Prerequisites

The student should have basic knowledge in transmission systems, probability theory, and graph theory. Should be able to obtain information from the literature, databases, and other sources in English, integrate the information, make their interpretation, draw conclusions, and justify opinions. Should also be able to communicate in English in a professional environment.

Course objective

To familiarize students with the fundamentals of the structures and operation of different kinds of telecommunication networks, the principles of their analysis, modeling, design, and services offered by them.

Course-related learning outcomes

Knowledge:
1. He has a structured knowledge in the field of telecommunication network architectures.

2. He has knowledge about the standards concerning telecommunication networks.
3. He knows the directions of telecommunication network development.

Skills:
1. He understands the basic requirements of the relevant international standards for basic telecommunication networks.
2. He can evaluate typical parameters indicating the proper operation of telecommunication networks.
3. He can choose the design of some elements and equipment for telecommunication networks.

Social competences:
1. He knows the limits of his knowledge and skills and understands the need for ongoing education.
2. He has awareness of the importance of telecommunication networks in the functioning of society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Knowledge aquired during the lectures is verified by the final exam. This exam is in the oral or/and written form, depending on the number of students.
The oral exam consists of a set of 5 questions, a set of questions is drawn from at least 10 sets; answer to each question is marked in 0-10 points. 50% of points are needed to pass the exam.
The written exam consists of 45-60 questions of multiple choice type. Students get 1 point for the correct answer and 0 points for wrong answer or lack of answer. 50% of points are needed to pass the exam. An additional oral question is possible for students with a number of points close to completion.

Skills mustered during laboratory classes are evaluated based on two colloquia, in the mid and at the end of the semester. To pass laboratories, both colloquia must be passed; the final mark depends on the sum of points of both colloquia:: 5.0 from 93%; 4.5 from 85%; 4.0 from 76%, 3.5 from 65%; 3.0 from 50%; 2.0 below 50%.

Programme content

Structures and operation of telecommunications networks, telecommunications services, construction and operation of network devices, basics of traffic theory.

Course topics

Lectures: The concept of telecommunication systems and networks. Network topologies, transfer modes, architectures, and communication models. Telecommunication networks evolution and classification. Telecommunication services: the concept of telecommunication services, classes, and attributes. Transmission media and protocols. Networks and network devices (routers, switches, etc.). Network connections, connection setup models, and procedures. Protection in telecommunication networks. The basics of traffic theory: telecommunication traffic and traffic engineering models.

Laboratory: laboratory exercises cover subjects on network traffic analyses, router"s basic configuration, routing protocols configuration, and exercises on network algorithms.

Teaching methods

Lectures: Lectures are conducted in the traditional form, with computer presentations that are available earlier to students. Some lectures, or their parts, are led as interactive or problem lectures, where students participate in solving some problems or examples, especially in proving some mathematical theorems.

Laboratory: laboratory classes use exercise methodology. Students have to realize practical exercises, according to provided descriptions, using different types of equipment (routers, switches, end devices) available in the laboratory and check if they operate correctly.

Bibliography

Basic

[1] R. L. Freeman, Fundamentals of Telecommunications, 2nd ed. John Wiley & Sons, Inc., 2005. (available from PUT network: https://onlinelibrary.wiley.com/doi/book/10.1002/0471720941)
[2] A. Valdar, Understanding telecommunications networks. The Institution of Engineering and Technology, 2006.
[3] T. N. Saasawi, M. H. Ammar, and A. El Hakeem, Fundamendals of Telecommunication Networks. Wiley, 1994.
[4] J. F. Kurose and K. W. Ross, COMPUTER NETWORKING A Top-Down Approach, Sixth. Pearshon, 2013.

Additional
[1] H. Akimaru and K. Kawashima, Teletraffic. Theory and Applications. London Berlin Heidelberg New York Paris Tokyo Hong Kong Barcelona Budapest: Springer-Verlag, 1993.
[2] N. Benvenuto and M. Zorzi, Priniples of Communications Networks and Systems. John Wiley & Sons, Ltd, 2011.
[3] H. J. Chao and B. Liu, High Performance Switches and Routers. John Wiley & Sons, Inc., 2007.
[4] Y.-D. Lin, R.-H. Hwang, and F. Baker, Computer Networks. An Open Source Approach. McGraw-Hill, 2012.
[5] L. L. Peterson and B. S. Davie, Computer Networks. A Systems Approach, 4th ed. Morgan Kaufmann, 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	70	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00